

A

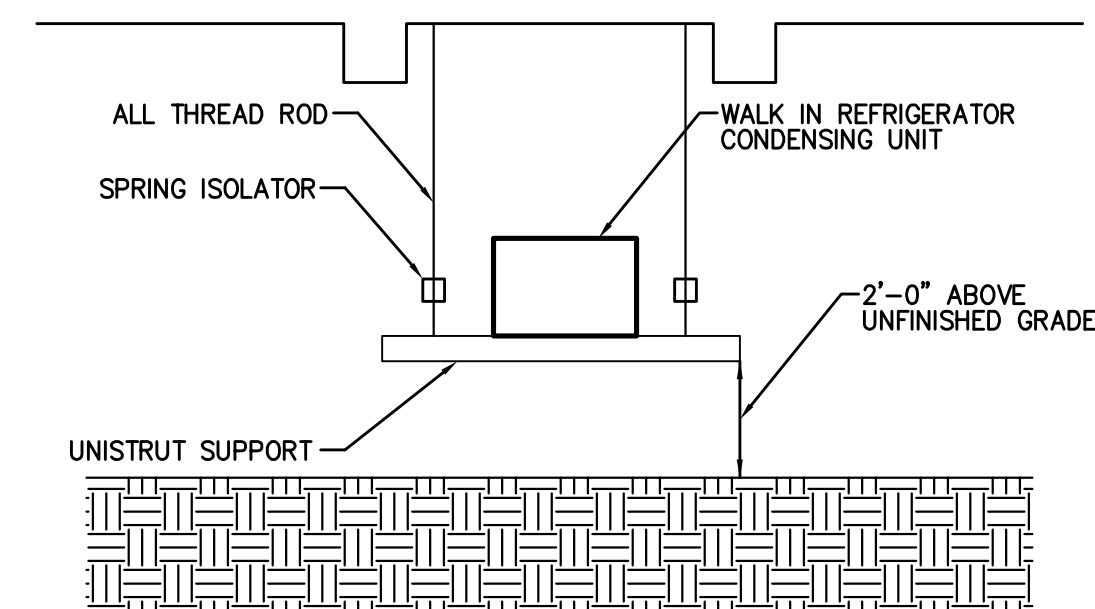
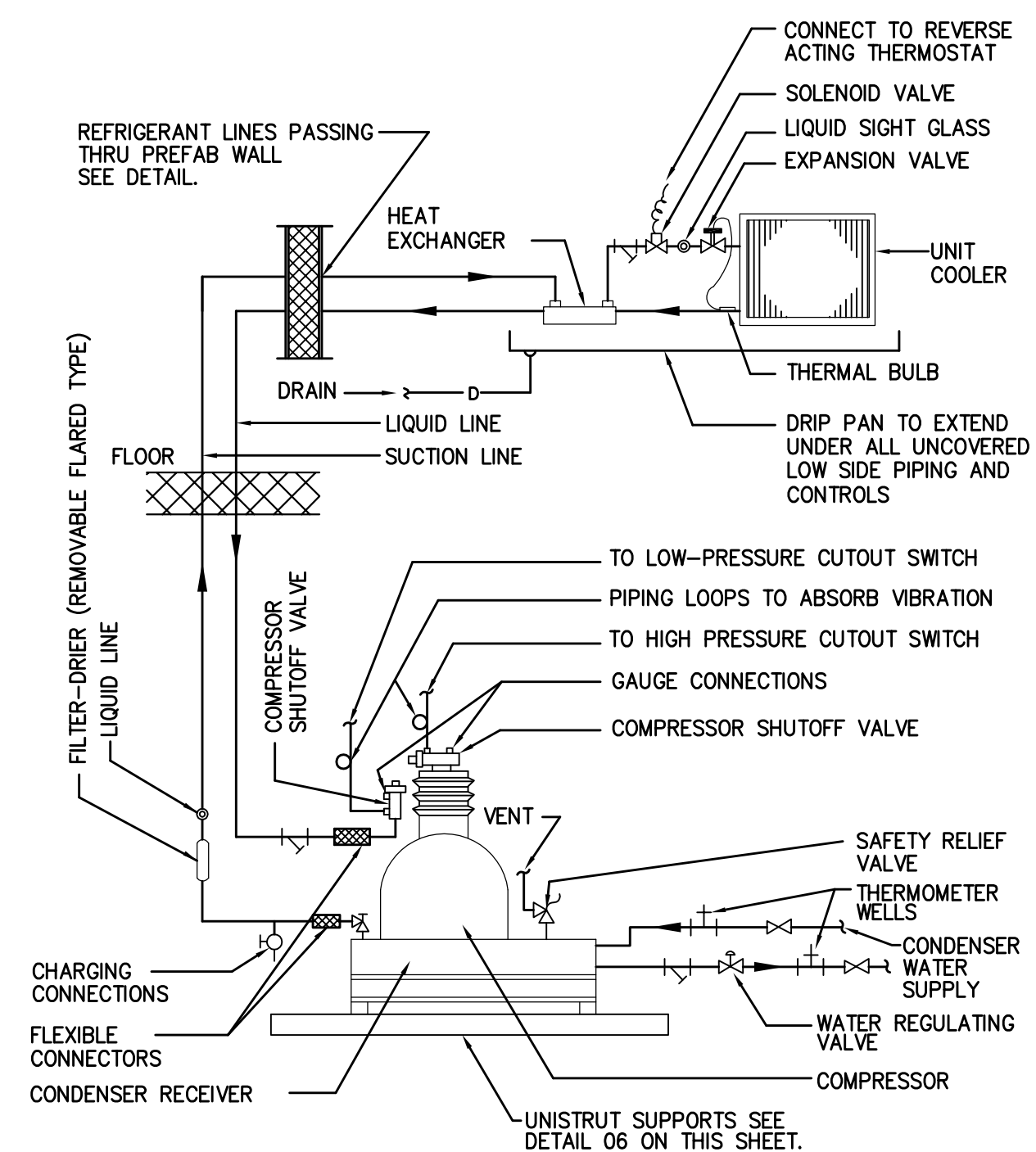
B

C

D

E

F



NOTE:

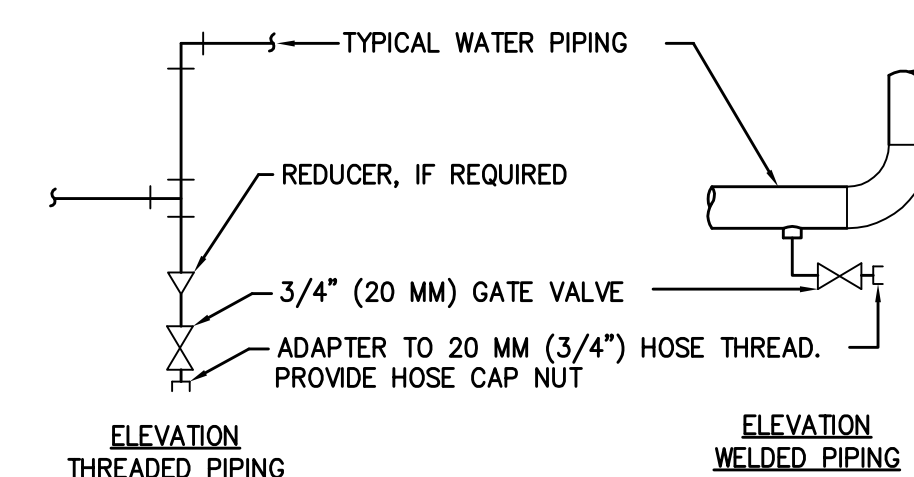
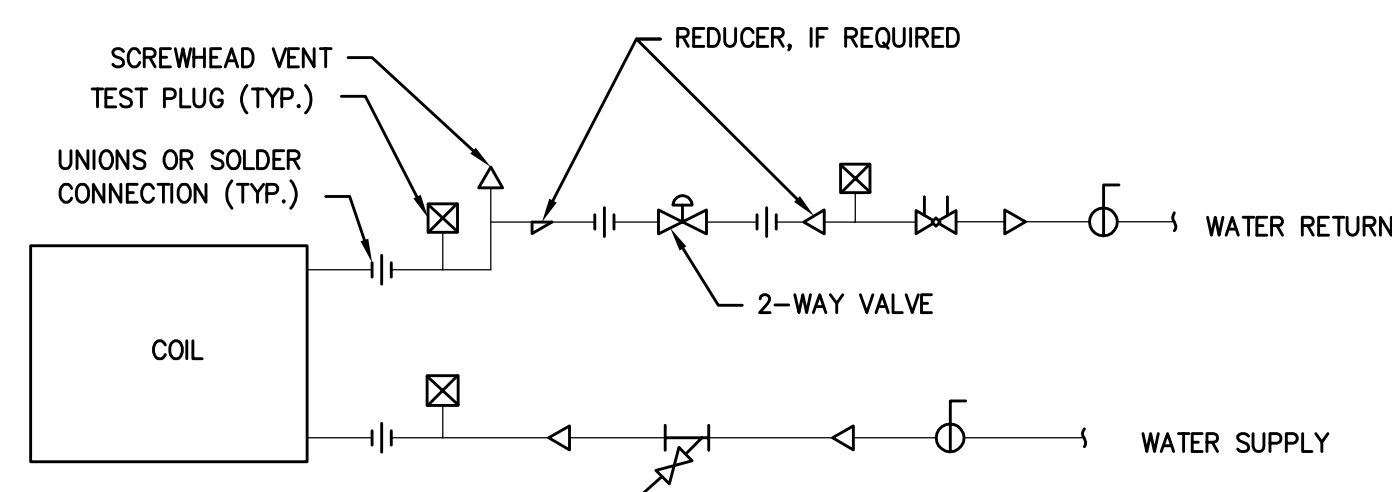
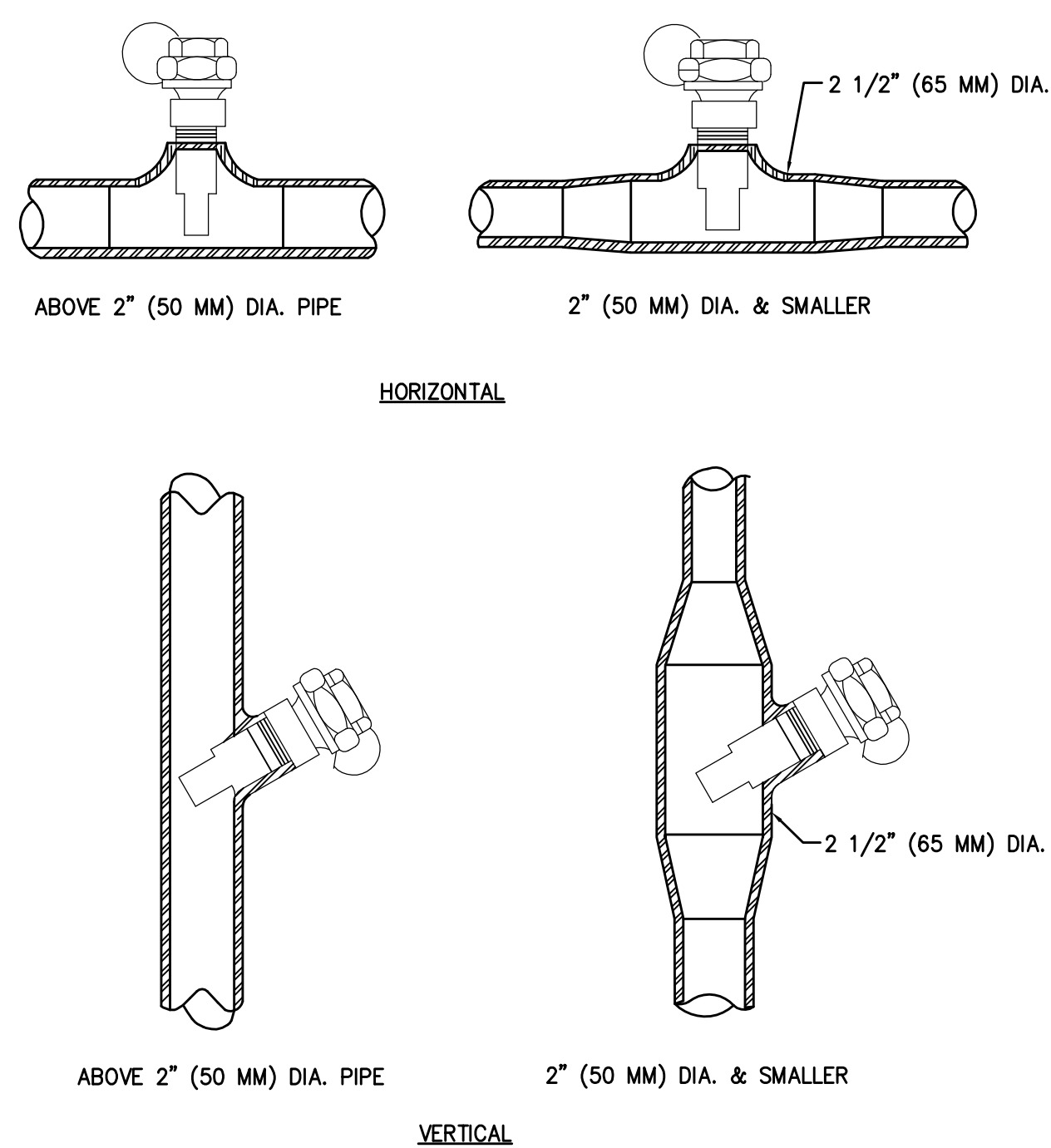
INSTALL WALK-IN REFRIGERATOR COMPRESSOR AND CONDENSER UNIT PER MANUFACTURERS RECOMMENDATIONS. MAINTAIN REQUIRED CLEARANCES.

4 REFRIGERANT PIPING FOR FLOOR MOUNTED COMPRESSOR

SCALE: NONE

5 REFRIGERANT PIPING COMPRESSOR MOUNTING DETAIL

SCALE: NONE

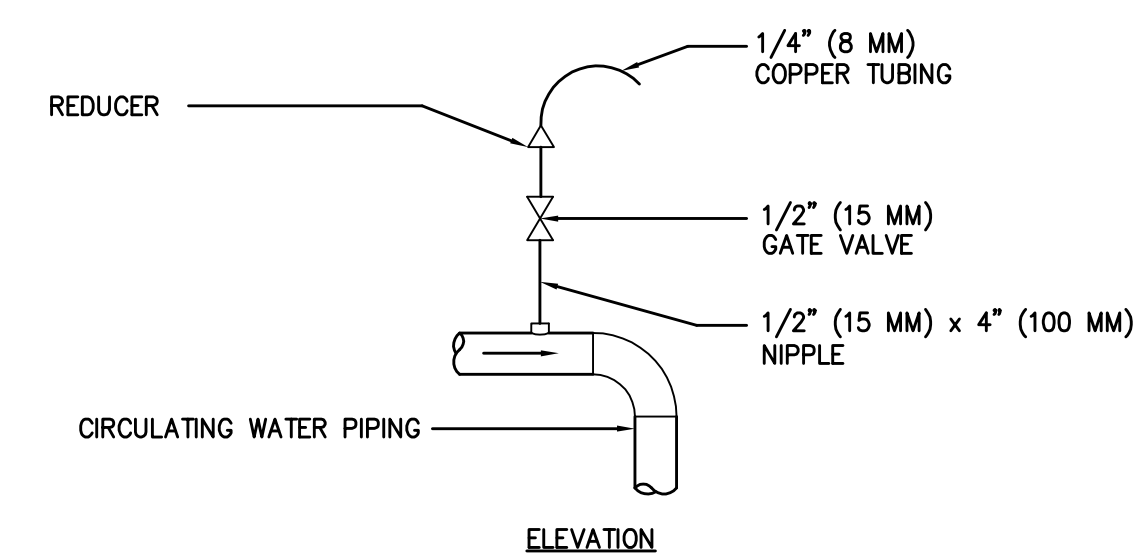


NOTES:

1. DRAIN ALL LOW POINTS AS INDICATED ABOVE.
2. WHERE SCALE POCKETS ARE SHOWN ON PIPE RISER DIAGRAMS AND/OR PLANS LOCATE DRAIN AT BOTTOM OF SCALE POCKET.

DESIGNER'S NOTE:

SHOW SCALE POCKETS ON MAJOR CIRCULATING WATER PIPING RISER DIAGRAMS AND/OR PLANS.



NOTES:

1. VENT ALL HIGH POINTS INDICATED ABOVE.
2. IF AUTOMATIC AIR VENTS ARE USED, PIPE DISCHARGE TO DRAIN

1 INSTALLATION OF THERMOMETER WELLS

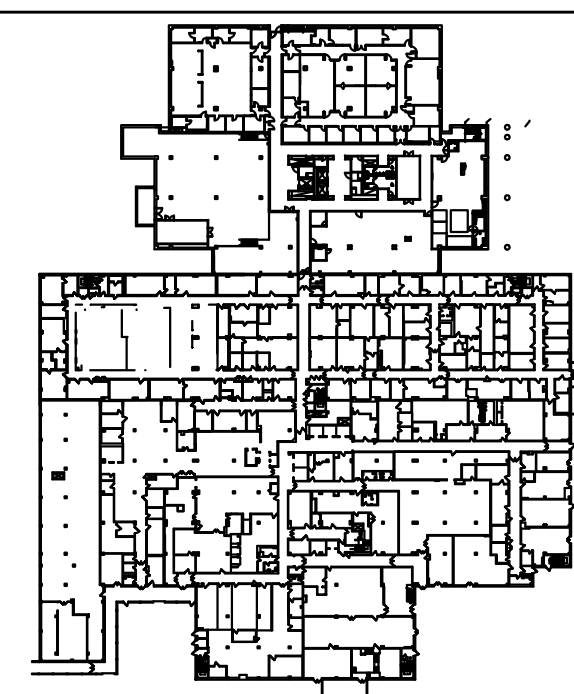
SCALE: NONE

2 TYPICAL HOT WATER COIL PIPING CONNECTIONS

SCALE: NONE

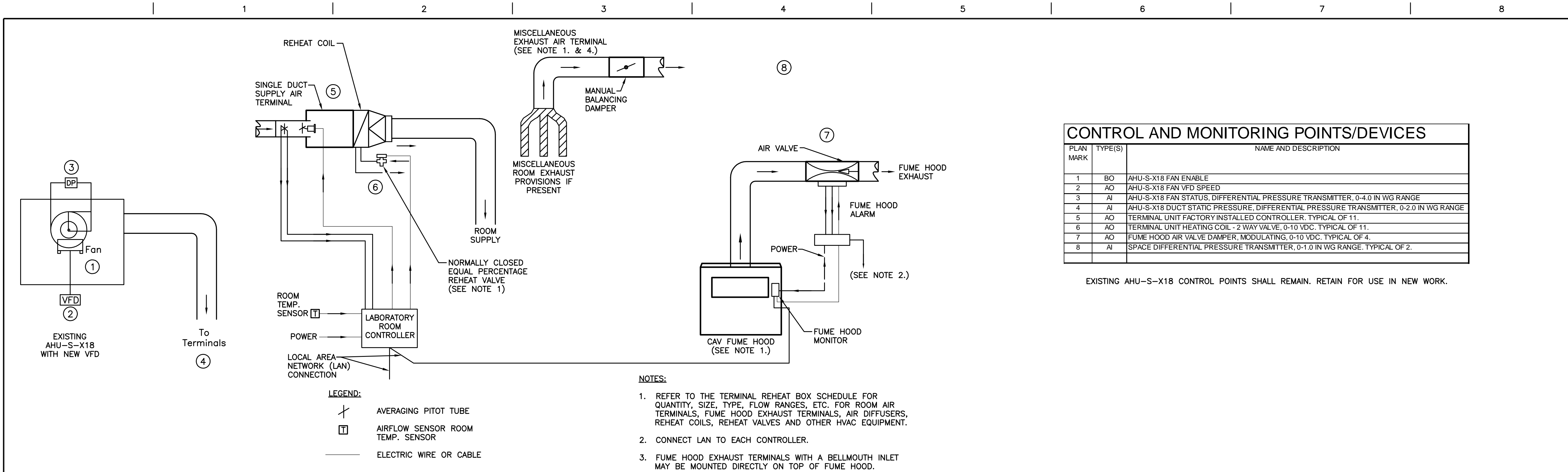
3 TYPICAL DRAIN AND AIR VENT CONNECTIONS

SCALE: NONE



BIDDING DOCUMENTS

[illegible]



4 TYPICAL LAB CONTROL DETAIL

SCALE: NONE

HVAC CONTROL SEQUENCE

NEW CONTROLS SHALL BE FULLY COMPATIBLE WITH THE EXISTING SIEMENS CONTROL SYSTEM. PROVIDE CONTROL DEVICES, LOW VOLTAGE TRANSFORMERS, RELAYS, SENSORS, CONTROL PANELS, CONTROL WIRING, AND CONDUITS TO ACCOMPLISH THE FOLLOWING SEQUENCE:

CONTROLS: AIR HANDLING UNIT AND FAN TERMINAL UNIT CONTROLS SHALL BE FULLY COMPATIBLE WITH THE EXISTING SIEMENS CONTROL SYSTEM. CONTROLS CONTRACTOR IS RESPONSIBLE FOR ALL INTERCONNECTING WIRING AND CONDUIT.

TYPICAL LABORATORY HVAC CONTROL SEQUENCE:

NEW VARIABLE FREQUENCY DRIVE FOR EXISTING AHU-SX18: VFD SHALL ADJUST FAN SPEED TO MAINTAIN A CONSTANT DUCT PRESSURE OF 3" W.C. (ADJUSTABLE) AS SENSED BY PRESSURE SENSOR (SP) MOUNTED APPROXIMATELY THREE-QUARTERS OF THE DUCT LENGTH DOWNSTREAM OF THE FAN. COORDINATE EXACT LOCATION WITH CONTRACTING OFFICER.

TERMINAL UNIT DAMPER SHALL MODULATE TO MAINTAIN A NEGATIVE PRESSURE OF 0.05" W.C. (ADJUSTABLE) IN LABORATORY ROOM SPACE WITH RESPECT TO HALLWAY AS MEASURED BY SPACE DIFFERENTIAL STATIC PRESSURE SENSOR MOUNTED NEAR LAB ENTRY DOOR. TERMINAL UNIT SHALL MAINTAIN A MINIMUM 12 AIR CHANGES PER HOUR OF AIRFLOW.

TERMINAL UNIT ASSOCIATED 2-WAY REHEAT HOT WATER VALVE SHALL MODULATE TO MAINTAIN A SPACE TEMPERATURE OF 72F (ADJUSTABLE) IN LABORATORY ROOM SPACE AS MEASURED BY TERMINAL UNIT WALL MOUNTED TEMPERATURE SENSOR.

FUME EXHAUST AIR VALVE SHALL BE FACTORY SET TO EXHAUST REQUIRED AIRFLOW TO MAINTAIN MINIMUM 100 FEET PER MINUTE VELOCITY (ADJUSTABLE) WHEN FUME HOOD SASH IS OPEN. FUME EXHAUST AIR VALVE SHALL ALSO MODULATE TO MAINTAIN A NEGATIVE PRESSURE OF 0.05" W.C. INTERLOCK AIR VALVE TO OPEN BASED ON MODULATING OF TERMINAL UNIT DAMPER.

TYPICAL ROOM HVAC CONTROL SEQUENCE:

TERMINAL UNIT DAMPER SHALL MODULATE OPEN IN RESPONSE TO THE SPACE TEMPERATURE RISING ABOVE THE OPERATOR ADJUSTABLE SPACE SETPOINT. WITH THE SPACE TEMPERATURE FALLING BELOW THE OPERATOR ADJUSTABLE SPACE SETPOINT THE TERMINAL UNIT DAMPER SHALL MODULATE TO MINIMUM POSITION. WHEN THE SPACE IS AT THE SPACE SETPOINT THE VAV TERMINAL DAMPER SHALL REMAIN IN MINIMUM POSITION. IF THE SPACE TEMPERATURE CONTINUE TO FALL BELOW THE OPERATOR ADJUSTABLE SPACE SETPOINT, TERMINAL UNIT ASSOCIATED 2-WAY HEATING HOT WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE AT THE SPACE SETPOINT.

ADJUSTABLE CLEVIS HANGER

TYPE 1 - SEE SPECIFICATIONS

INSULATION (VAPOR BARRIER TYPE IS REQUIRED FOR LOW TEMPERATURE PIPE)

PROVIDE HIGH COMPRESSIVE STRENGTH INSULATION (9 PCF MIN. DENSITY) UNDER INSULATION SHIELD

INSULATION SHIELD AT HANGER

WELD

SADDLE

1/2" DIA. HANGER RODS WITH 36" MAX. SPACING ON EACH CHANNEL

BAND

1 5/8" 12 GAGE CHANNEL OR 2"x2"x1/4" ANGLE

1" MAX.

SIDE VIEW

TRAPEZE HANGER FOR UP TO 1000 LB. UNIFORM LOAD

MAXIMUM PIPE/TUBING SUPPORT SPACING																		
NOM. SIZE IN.	THRU 3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20	24
PIPE FT.	7	7	7	9	10	11	12	14	16	17	19	22	23	25	27	28	30	32
TUBING FT.	5 FT	6	7	8	8	9	10	12	13	14	16	-	-	-	-	-	-	-

NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.

DESIGNER'S NOTE:
SHOW ON THE DRAWINGS OTHER SPECIFIED AND SPECIAL AND SPECIAL PIPE SUPPORTS WHERE REQUIRED.

1/4" O.D. BRASS FLEX PIGTAIL (TYP.)

TESCOM 44-3400 SERIES DUAL STAGE HIGH PURITY HIGH FLOW GAS PRESSURE REGULATOR OR EQUAL 0-3000 PSIG OUTLET PRESSURE. CGA #320-CO2/CGA #580-N2. CYLINDER AND DELIVERY PRESSURE GAUGES, TEE PURGE ASSEMBLY, 1/4"O.D. FITTING AT OUTLET PORT. (TYP.)

SHUTOFF VALVE WITH 1/4" FITTING AND VALVE MOUNTING BRACKET(TYP.)

TYPE "L" SEAMLESS COPPER TUBING, SEE SPECIFICATION.

MATHISON #510-C OR EQUAL CAST ALUMINUM GAS CYLINDER WALL BRACKET WITH SAFETY STRAP AND CHAIN, ANCHOR TO UNISTRUT CHANNEL OR EQUAL WITH SPRING NUTS AND ROUND HEAD MACHINE SCREWS (TYP.)

UNISTRUT #P1000 CHANNEL, FIELD CUT TO REQUIRED LENGTH AND ANCHOR TO STRUCTURAL WALL STUDS 1/4"x 1 1/2" (NO. 14) TYPE 410 STAINLESS STEEL TEKS HEX WASHER HEAD SCREWS AT 16" O.C. (TYP.)

NITROGEN (N2) GAS CYLINDER BY OWNER, CYLINDER DELIVERY PRESSURE 600 PSIG - FIELD VERIFY.

CARBON DIOXIDE (CO2) GAS CYLINDER BY OWNER, CYLINDER DELIVERY PRESSURE 600 PSIG - FIELD VERIFY.

TO LAB

1 SEQUENCE OF OPERATIONS

SCALE: NONE


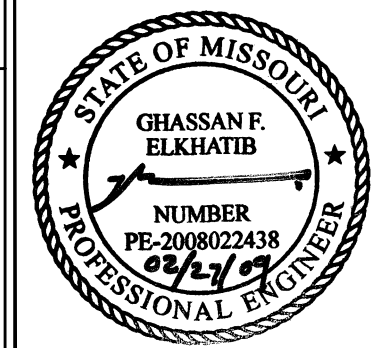



2 TYPICAL PIPE HANGERS

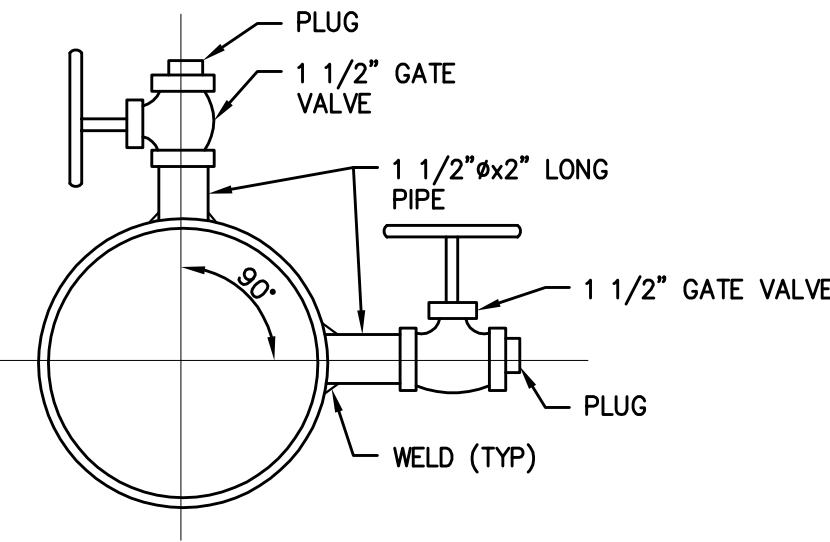
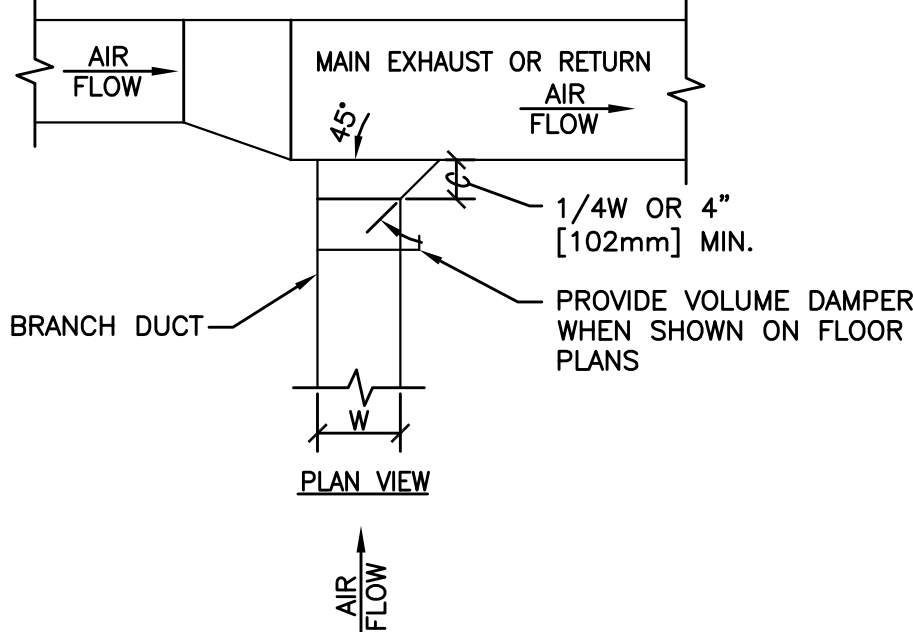
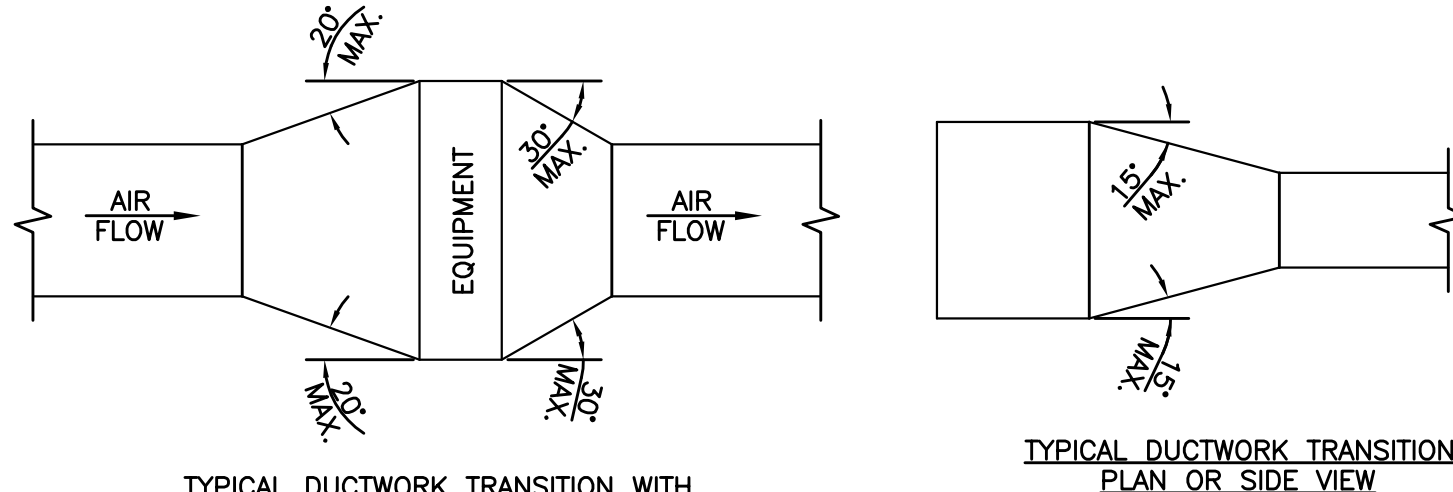
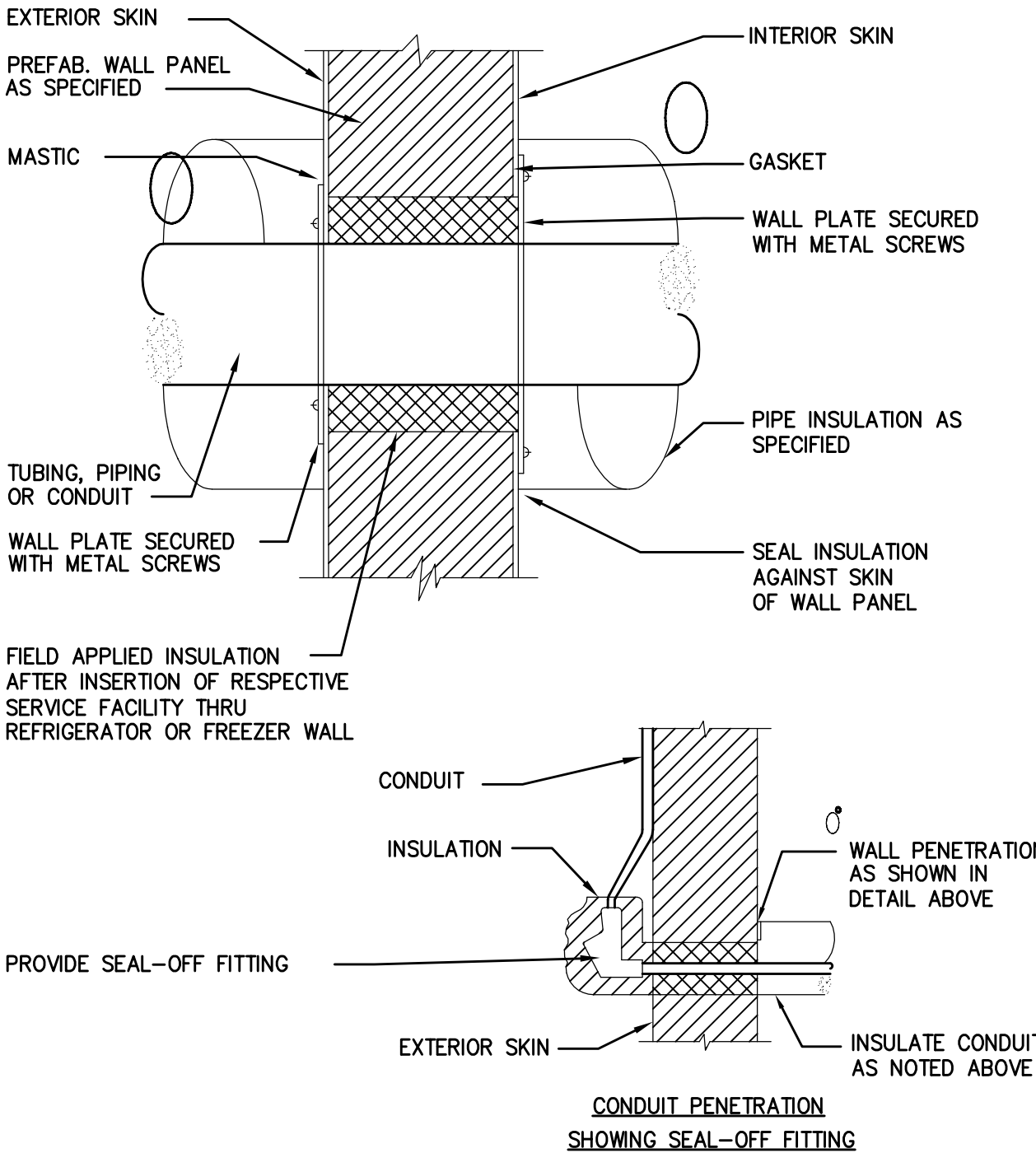
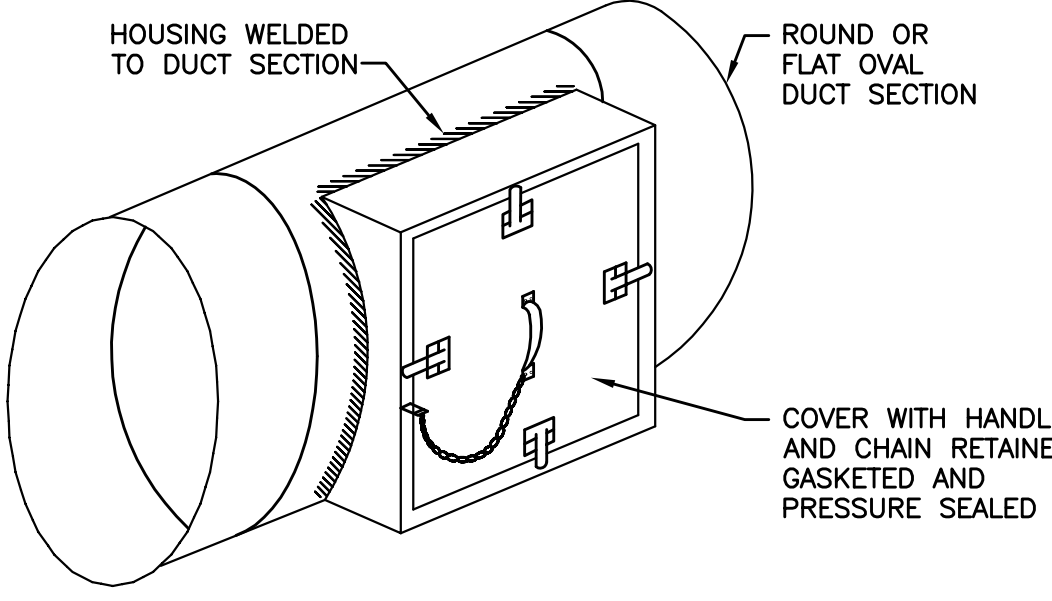
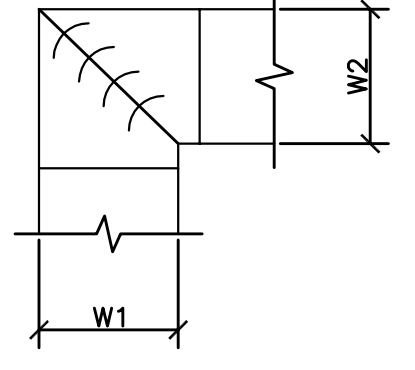












SCALE: NONE

3 TYPICAL CARBON DIOXIDE / NITROGEN CYLINDER MANIFOLD DETAIL

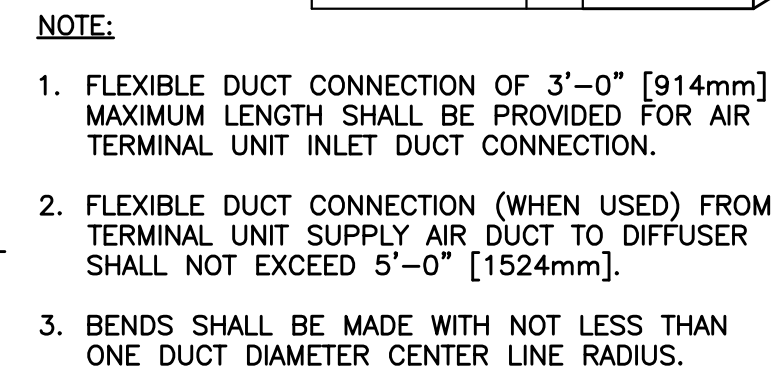
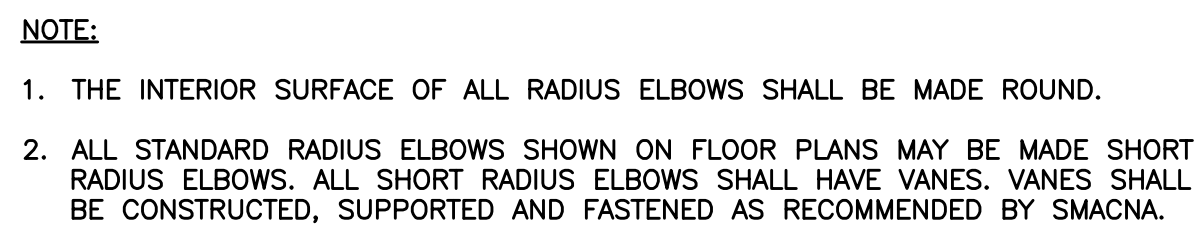
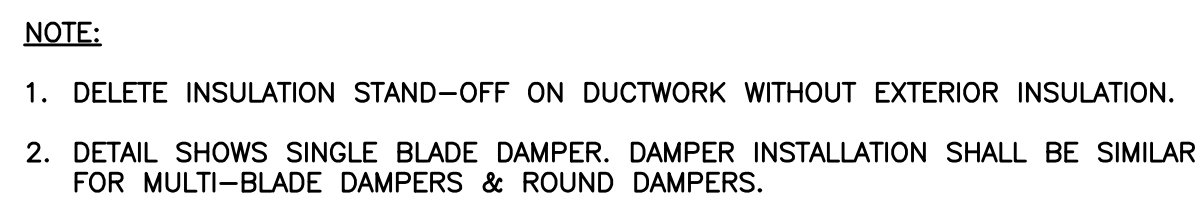
SCALE: NONE

BIDDING DOCUMENTS

CONSULTANTS:  1485 West 104th Terrace Cedar Rapids, IA 52402 PHONE: (319) 258-4565 FAX: (319) 258-2741				ARCHITECT/ENGINEERS:  BERGER DEVINE YAEGER 3700 BROADWAY, SUITE 300 KANSAS CITY, MO 64111  GPW & ASSOCIATES, LLC 1001 NEW HAMPSHIRE LAWRENCE, KS 66044		Drawing Title MECHANICAL DETAILS Approved Project Director		Project Title RENOVATE RESEARCH - SECTION B LAB VA MEMORIAL HOSPITAL Location COLUMBIA, MO Date MARCH 04, 2009 Checked SJD Drawn BSF		Project Number 589A4-07-109 Building Number Drawing Number M4.1 Rev. of		Office of Facilities Management 	
--	--	---	--	---	--	--	--	---	--	---	--	---	--

	 <p>NOTE:</p> <ol style="list-style-type: none">PROVIDE IN HEATING HOT WATER MAIN.LOCATE PILOT TUBE TAPS 20 PIPE DIAMETERS DOWNSTREAM AND 10 PIPE DIAMETERS UPSTREAM FROM THE NEAREST PIPE FITTING.		 <p>NOTE:</p> <p>PROVIDE VOLUME DAMPER WHEN SHOWN ON FLOOR PLANS</p>	 <p>NOTE:</p> <p>UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.</p>																																		
	4 PILOT TEST CONNECTIONS SCALE: NONE	5 EXHAUST OR RETURN BRANCH DUCTWORK SCALE: NONE	6 TYPICAL DUCTWORK TRANSITION SCALE: NONE																																			
	 <p>TYPICAL DETAIL FOR TUBING, PIPING AND CONDUITS PASSING THROUGH PRE-FAB INSULATED WALL PANELS</p>	 <p>NOTE:</p> <p>COVER WITH HANDLE AND CHAIN RETAINER GASKETED AND PRESSURE SEALED</p>	 <p>NOTE:</p> <ol style="list-style-type: none">ALL VANED ELBOWS SHALL BE CONSTRUCTED AND INSTALLED AS DETAILED BY SMACNA.WHEN W1 DOES NOT EQUAL W2, VANE SHALL BE SINGLE VANE TYPE REGARDLESS OF W DIMENSION.ALL SINGLE VANES SHALL HAVE A 2" RADIUS, 1 1/2" MAXIMUM SPACE BETWEEN VANES AND A 3/4" TRAILING EDGE.WHEN W EQUALS W2 AND W1 IS GREATER THAN 20" VANES SHALL BE DOUBLE VANE TYPE.																																			
	1 TYPICAL THROUGH WALL DETAIL SCALE: NONE	2 ACCESS SECTION FOR ROUND/OVAL DUCT SCALE: NONE	3 DUCTWORK SQUARE VANED ELBOWS SCALE: NONE																																			
	BIDDING DOCUMENTS																																					
	<table><tr><td></td><td>CONSULTANTS:</td><td></td><td>ARCHITECT/ENGINEERS:</td></tr><tr><td></td><td></td><td></td><td><div>BERGER DEVINE YAEGER 3700 BROADWAY, SUITE 300 KANSAS CITY, MO 64111</div><div>GPW & ASSOCIATES, LLC 1001 NEW HAMPSHIRE LAWRENCE, KS 66044</div></td></tr></table>		CONSULTANTS:		ARCHITECT/ENGINEERS:				 <div>BERGER DEVINE YAEGER 3700 BROADWAY, SUITE 300 KANSAS CITY, MO 64111</div>  <div>GPW & ASSOCIATES, LLC 1001 NEW HAMPSHIRE LAWRENCE, KS 66044</div>	<table><tr><td>Drawing Title</td><td colspan="2">MECHANICAL DETAILS</td></tr><tr><td>Approved Project Director</td><td colspan="2"></td></tr></table>	Drawing Title	MECHANICAL DETAILS		Approved Project Director			<table><tr><td>Project Title</td><td colspan="2">RENOVATE RESEARCH - SECTION B LAB VA MEMORIAL HOSPITAL</td></tr><tr><td>Location</td><td colspan="2">COLUMBIA, MO</td></tr><tr><td>Date</td><td>Checked</td><td>Drawn</td></tr><tr><td>MARCH 04, 2009</td><td>SJD</td><td>BSF</td></tr></table>	Project Title	RENOVATE RESEARCH - SECTION B LAB VA MEMORIAL HOSPITAL		Location	COLUMBIA, MO		Date	Checked	Drawn	MARCH 04, 2009	SJD	BSF	<table><tr><td>Project Number</td><td>589A4-07-109</td></tr><tr><td>Building Number</td><td></td></tr><tr><td>Drawing Number</td><td>M4.2</td></tr><tr><td>Dwg. of</td><td></td></tr></table> <div>Office of Facilities Management Department of Veterans Affairs</div>	Project Number	589A4-07-109	Building Number		Drawing Number	M4.2	Dwg. of	
	CONSULTANTS:		ARCHITECT/ENGINEERS:																																			
			 <div>BERGER DEVINE YAEGER 3700 BROADWAY, SUITE 300 KANSAS CITY, MO 64111</div>  <div>GPW & ASSOCIATES, LLC 1001 NEW HAMPSHIRE LAWRENCE, KS 66044</div>																																			
Drawing Title	MECHANICAL DETAILS																																					
Approved Project Director																																						
Project Title	RENOVATE RESEARCH - SECTION B LAB VA MEMORIAL HOSPITAL																																					
Location	COLUMBIA, MO																																					
Date	Checked	Drawn																																				
MARCH 04, 2009	SJD	BSF																																				
Project Number	589A4-07-109																																					
Building Number																																						
Drawing Number	M4.2																																					
Dwg. of																																						

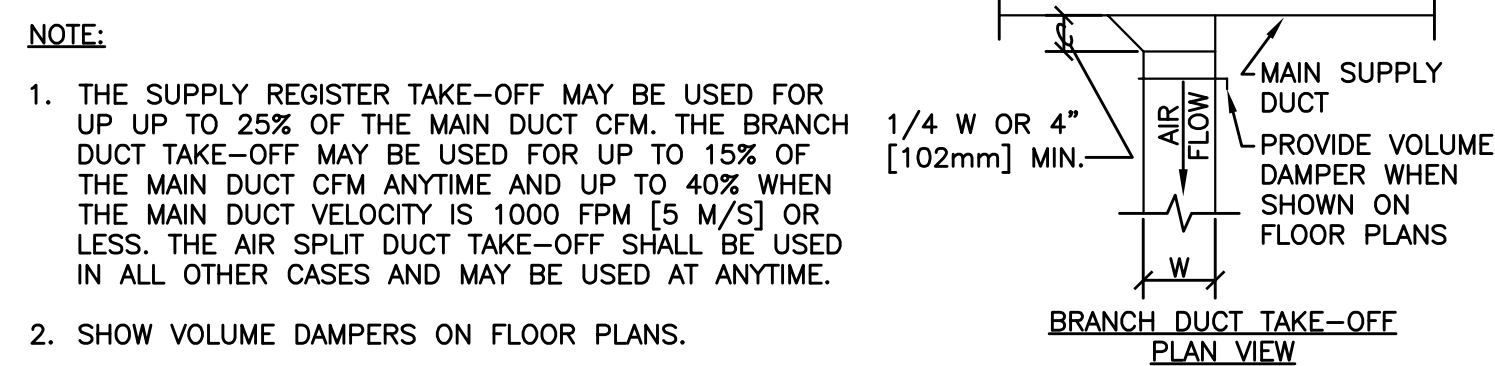
VA FORM 08-6231, OCT 1978



SCALE: NONE

SCALE: NONE

SCALE: NONE



SCALE: NONE

SCALE: NONE

SCALE: NONE

VA FORM 08-6231, OCT 1978


APEX
ENVIRONMENTAL CONSULTANTS, INC.

14955 West 101st Terrace
Lenexa, KS 66215

PHONE: (913) 338-APEX (2799)
FAX: (913) 338-2741

ARCHITECTURE ■ INTERIORS ■ PLANNING
Kansas City, MO 816-265-7700

GPW & ASSOCIATES, LLC
001 NEW HAMPSHIRE

LAWRENCE, KS 66044

MECHANICAL DETAILS

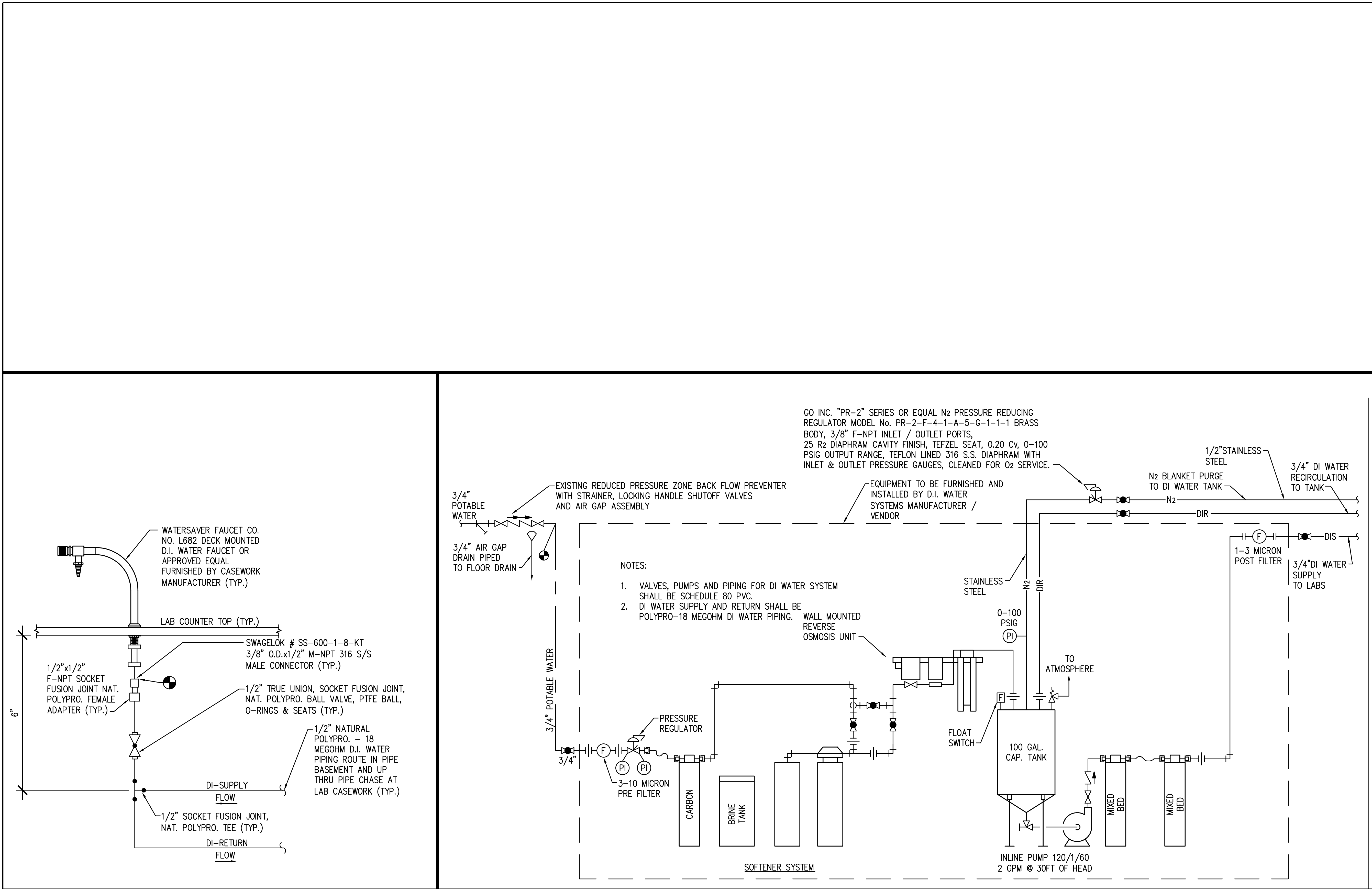
RENOVATE RESEARCH - SECTION B LAB
VA MEMORIAL HOSPITAL**Drawn****Drawn**

589A4-07-109

	Drawing Number

Date of

 Department of
Veterans Affairs



1 DI FAUCET DETAIL
SCALE: NONE

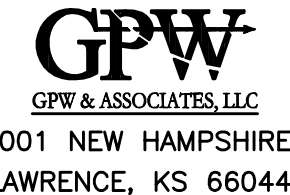
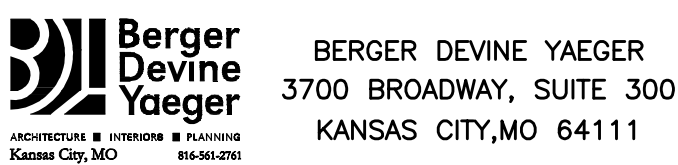
2 DI WATER FLOW DIAGRAM
SCALE: NONE

Revision	Date

CONSULTANTS:



ARCHITECT/ENGINEERS:



Drawing Title	MECHANICAL DETAILS
Approved Project Director	

BIDDING DOCUMENTS

Project Title	RENOVATE RESEARCH - SECTION B LAB VA MEMORIAL HOSPITAL
Location	COLUMBIA, MO
Date	MARCH 04, 2009
Checked	SJD
Drawn	GWJ

Project Number	589A4-07-109
Building Number	
Drawing Number	M4.4
Doc. of	

